UNITED STATE ENVIRONMENTAL PROTECTION AGENCY
ENVIRONMENTAL RESPONSE TEAM - WEST
4220 S. MARYLAND PARKWAY
BUILDING D, SUITE 800
LAS VEGAS, NEVADA 89119

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MEMORANDUM

SUBJECT: Comments on the "Proposed Fingerprinting Plan for Radiological Sites in Niagara Falls Area"

FROM: Lyndsey Nguyen
Health Physicist, Environmental Response Team-West (ERT-W)

TO: File for Niagara County Radiological Sites
Attn: Eric Daly, On-Scene Coordinator (OSC), Region 2

The EPA assessed sites in Niagara County have a variety of different radiological contaminants. For example, the Niagara Falls Boulevard site contained over five physically different types of "slag" identified as a rock-like material with various color, size, brittleness, and texture. With little to no data on the signature of the potential responsible party's contamination, the determination for analysis, and more specifically the methodology, can vary. The decision to use one analysis vs. another analysis can be due to cost of the analysis, laboratory capability, timing/deadlines, preparation requirements, limitations of instrumentation, as well as other decision factors. In general, the analyses and methodologies chosen is decided by the data interpreter's preference for specific analysis/methodology. No one analysis is the correct choice for fingerprinting, and many different analyses can be conducted to give the same type of result.

Based on the sections described in the "Proposed Fingerprinting Plan for Radiological Sites in Niagara Falls Area," some preliminary considerations are outlined below:

Metals and other elements at parts per million (ppm) levels.

Inductively Coupled Plasma-Atomic (or Optical) Emission Spectrometry (ICP-AES or ICP-OES) might also be an option instead of Inductively Coupled Plasma-Mass Spectrometry (ICP-MS).

Additional analyses may include one or more of the following, based on site- or information-specific needs:

a. ***Specific Radionuclides***

Gamma spectrometry is highly suggested. The determination of equilibriums should be evaluated amongst the decay chains of Uranium-238 (U-238) and Thorium-232 (Th-232). The equilibrium may give hints to various separation processes, the products manufactured, or wastes accumulated on site by the PRP. The determination of equilibrium may also identify if the sample is naturally occurring or background. Alpha spectrometry could also be conducted.

b. ***Major and minor elements and "associations" with other elements***

Scanning electron microscopy/energy dispersive x-ray spectroscopy (SEM-EDS) is not able to see trace components of a sample. Sample preparation should be considered prior to sending samples to the laboratory. Isolate the component of interest in the sample by removing all unwanted. Recommendation includes biasing samples to suspected contamination. For example, if a piece of slag has gravel attached, chisel the gravel rock off the slag before sending the sample to the laboratory.

In reaching out to multiple sources, the "Proposed Fingerprinting Plan for Radiological Sites in Niagara Falls Area" appears to be a good starting point. Depending on these initial results, additional analyses may be needed to better identify the specific characteristics of material.

For further information, a comprehensive description of various analyses and methodologies can be found at:

https://cfpub.epa.gov/si/si_public_record_report.cfm?dirEntryId=339252

In addition, an electronic searchable list of chemical analyses and methodologies can be accessed at the following website:

https://www.epa.gov/homeland-security-research/sam-chemical-methods-query